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Analyzing the Relationships between the Teen-agers' Self-image and Their Preferences for Science Disciplines Contents

Gabriel Gorghiu[a] *, Camelia Delia Voicu[b] , Laura Monica Gorghiu[c]

[a]*Teacher Training Department, Valahia University Targoviste, 5 Moldovei str., 130093 Targoviste, Romania*
[b]*Faculty of Orthodox Theology and Educational Science, Valahia University Targoviste, 35 Lt. Stancu Ion str., 130105 Targoviste, Romania*
[c]*Faculty of Sciences and Arts, Valahia University Targoviste, 18-24 Unirii blvd., 130082 Targoviste, Romania*

Abstract

Vocational orientation of adolescents is a challenge not only for teachers and parents, but especially for teenagers. Often the identity crisis specific to this age can be an obstacle in building a school and later a professional path appropriated for student personality. In this sense, actions taken to address the knowledge and self-knowledge of adolescents' self-image become indispensable. In addition, these approaches facilitate the identification of potentials skills and attitudes that can facilitate the development of scientific skills and increase the efficiency of learning. The paper presents a micro research conducted in order to identify relationships between the teen-agers' self-image and their preference for the contents of the scientific disciplines of secondary education. The research sample consisted of 146 students aged between 14 and 19, who followed PROFILES type Science classes (Physics, Chemistry, Biology) in several schools in Dambovita County, Romania. The research hypotheses were: H1 Positive self-image correlates with increased preference for questioning and ambiguous issues; H2 Positive self-image influences in lesser extent students interest`s for certain contents. As research methods, there were used questionnaire for identifying students' interests on certain contents, and self-assessment test for self-image. The results are discussed in the perspective of scientific literacy skills development.

Peer-review under responsibility of Academic World Research and Education Center.

Keywords: adolescent self-image, self- knowledge, scientific classes, scientific literacy, PROFILES Project

* Gabriel Gorghiu. Tel.: +40-742-879508.
E-mail address: ggorghiu@gmail.com

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1. Research Context

The study of Science and hence scientific literacy are considered a challenge rather difficult for most nowadays teenagers, especially because quite abstract level of information (theories) and complexity of analysis and calculation skills involved in resolving any problems or issues of Physics, Chemistry and Biology. As a proper example, in the last three years, in Romania and other twenty European countries, the PROFILES project was implemented with success, being a meeting-point for Science teachers and European educators and researchers.

One of the main objectives of the FP7 European Research Project "*PROFILES - Professional Reflection-Oriented Focus on Inquiry-based Learning and Education through Science*" (code: 5.2.2.1-SiS-2010-2.2.1-266589), was to develop a continuous professional development program with the view to enhance the teachers' scientific and pedagogical skills in order to promote *Inquiry-Based Science Education* (*IBSE*) through raising their self-efficacy to take ownership of more effective ways of teaching students, supported by stakeholders (PROFILES Consortium, 2010).

By making observations on the data obtained through the project, on the ideal type of science class, a question arose regarding whether the specific study content preferences are influenced by the students' self-image, which led to the shaping of the present research.

2. Theoretical aspects

The teenage years are a period of demanding somatic and psychosocial development, and also with quite demanding social expectations from families, peers and school. Along with the development of cognitive skills and the socio-cultural competences, among the major objectives of the high-school educational level, there can be found the shaping of abilities for analyzing acquired skills and competences - for professional orientation purpose - , and the developing of self-confidence and positive image of personal success (Bocos & Jucan, 2008). Those two last objectives are achieved through activities that allow adolescents to self-knowledge either within hours specially designed for this purpose - the tutoring or counseling classes -, either in the classes from different disciplines that pupils are studying (if those classes address teaching and learning from a humanistic, or constructivist perspective). Moreover, a better self-knowledge by adolescents may be an important aspect of academic success, through allowing capitalization of strengths and overcoming or compensation of weaknesses. Also, the self-esteem caused by a positive self-image favors showing respect from others. Thus, in the context of educational relationships of respect and appreciation, learning and self-image reinforce each other, as long as the students accept each other as individuals. (Joita, 2008). In addition, conflict resolution is easy to achieve when young people involved in the conflict can put out the best in them without devaluing the others, are not blaming themself and do not blame others, thus building good peers relationships. Also a positive self-image can act as a motivator in academic activities by activating perceived self-efficacy mechanism. (Lent, Brown, & Larkin, 1986).

Self-knowledge, defined as the process of exploration and structure of someone own characteristics (skills, emotions, motivations, attitudes, beliefs, and adaptive defence mechanisms, etc.), having as result the self-image, is an important concern for teenagers that cro**sses** an identity crisis. That because self-knowledge and self-acceptance are fundamental variables in functioning and optimum adaptation to the social environment and in maintaining mental and emotional health. The efforts of self-knowledge has the effect of not only the awareness of some features of him/herself, that is awareness of self-image, but also raise the awareness of emotions, attitudes that the teen has for itself, namely self-esteem. Although both psychological concepts have positive or negative effects on learning activities, the most were investigated relationships between self-esteem and school efficiency. This, probably because self-esteem and self-image are intertwined, and positive self-esteem is a motivating factor that influences not only academic achievement, but also children school integration.

Another "advantage" of self-knowledge is that through its steps, along with mutual understanding in the peers group, is facilitated the building of a coherent self-identity, which allows the building of a vocational identity. If self-identity gives individual a sense of unity, continuity and consistency of his being, "professional (vocational) identity gives individual the feeling of coherence, first in the upper secondary education - which involves a first vocational orientation -, and later in the world of work, and finally in context his professional career." (Negovan, 2004, p.12). Combining aspects of knowledge of own interests, values, abilities and skills on the one hand, with a preference for a certain type of activity, interaction styles and work environments, on the other hand, vocational

identity is constituted at "the confluence of teenager multiple learning and working experiences and become its standard of (psychosocial) maturation" (Lemeni, 2001, p. 208).

Post-modern didactics recognizes and emphasizes the importance of including aspects of self-knowledge and personal development in the teaching-learning-assessment activities, supporting the development of intrinsic motivation with high relevance for student`s self-identity and vocational identity, especially for teenagers. So any physics, or history, or arts class can be an opportunity to become aware of the student`s interests, values, attitudes, beliefs, level of development of various skills and abilities, or even some personality traits, all of these being components of professional identity. On the other hand, the identification of these components can influence school efficiency by confirmation or refutation of choosing a suitable school routes, but also by influencing preferences for some school learning content or/and disciplines.

3. Research Methodology

The research objective was to identify possible relations between adolescent`s self-image and his/her preference for some contents of the scientific disciplines of upper secondary education. We use purposeful sampling, in order to obtain a big and heterogeneous enough number of respondents from the PROFILE Project. The lot of research consisted of 146 students (boys and girls) aged between 14 and 19, from 4 schools in Muntenia region. All of them are students from science high-school branch. The research hypotheses were: (H1) - Positive self-image correlates with increased preference for contents that involve questioning and ambiguous issues; (H2) - Positive self-image influences in lesser extent students interest`s for certain contents. As research methods, there were used questionnaire for identifying the students' interests on some aspects of scientific classes contents, and self-report questionnaire of 35 items for identifying the adolescent's self-image (adaptation of Dembo-Rubinstein test for self-image). The first questionnaire contained 15 questions regarding four content categories: the complexity of the subjects to be learned, using of signs and symbols, the study of facts and images, and personal and societal relevance of the lessons content. The features contained in the second questionnaire were: looks (beautiful, good looking, attractive), cognitive features (I.Q., creativity, imagination, learning abilities), altruistic features (openness, helpful, empathy, kindness, emotionality, sensibility), working style (diligent, ambitious, tidy, tenacious, resourceful), and social relations (popular, authoritative, respected, lonely, supercilious, inhibited).

4. Results and discussions

Data obtained on student`s interests on scientific classes contents (first questionnaire) are concentrated in figures 1-6.

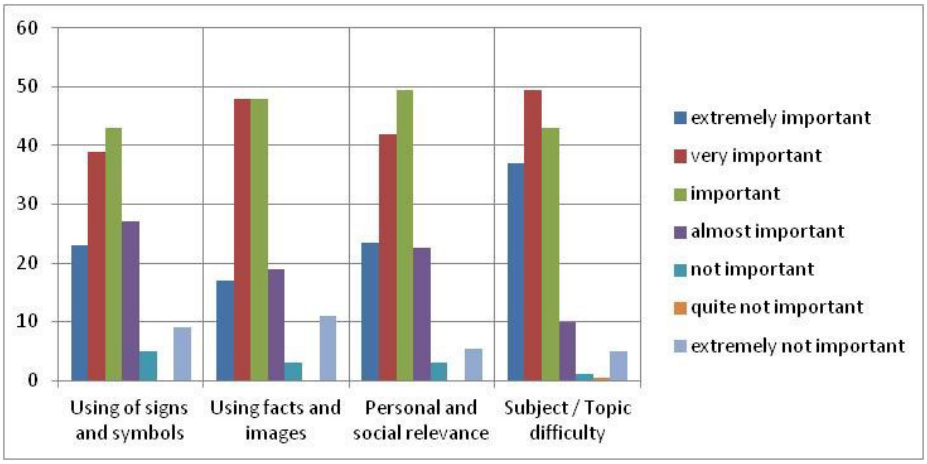

Figure1. Boys and girls answers related to preferred content categories

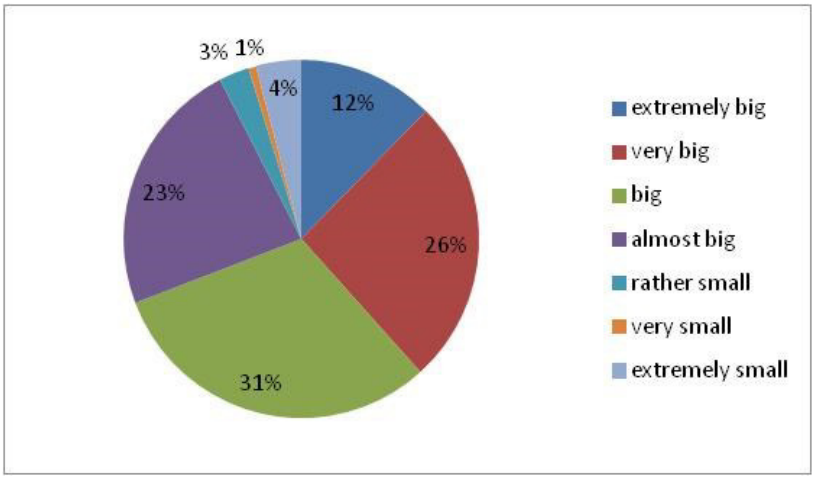

Figure 2. Teen's preferences for the subjects that requires involvement in understanding process

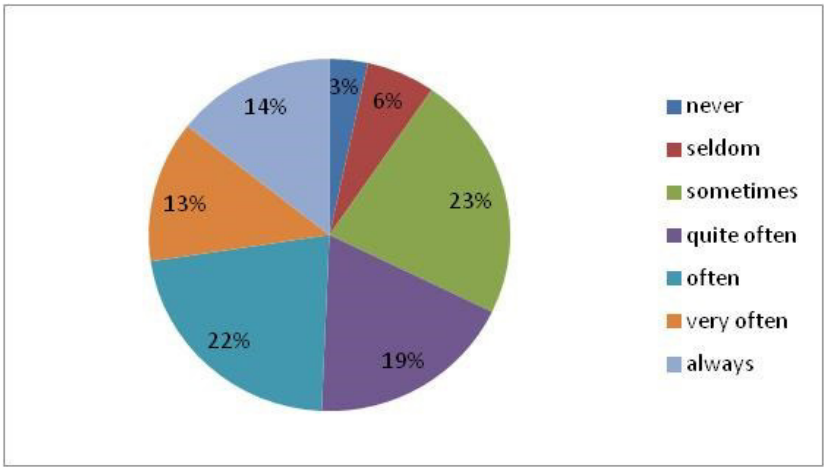

Figure 3. Teen's preference for active involvements in learning process

As observed, more than half of the students are largely interested in more complex, problematical subjects, which can be explored, reflected, respectively for subjects eliciting critical thinking, personal effort of knowledge and understanding. Also, they are highly interested in subjects with personal relevance (related to daily activities) and societal relevance, which may suggest the existence of intrinsic motivation to study science. Also, the increased importance of facts and images may indicate concern for objectivity and the need for concrete argumentation of the theories.

Regarding the data obtained about self-image, we found the following aspects:

- the test scores indicate a positive self-image of the students (11 of the 146 had negative scores), which may suggest that students who opt for Sciences Branch in high school have trust in their capabilities to cope with a profile considered difficult.

- there were no significant differences between male-female regarding items related to cognitive characteristics - both categories appreciates at a rate of over 50% that are intelligent, creative and have learning skills (Figure 4). This can justify their interest in complex topics that spark their capacities for analysis and problem solving (i.e. capitalization of positive aspects, strengths etc.)

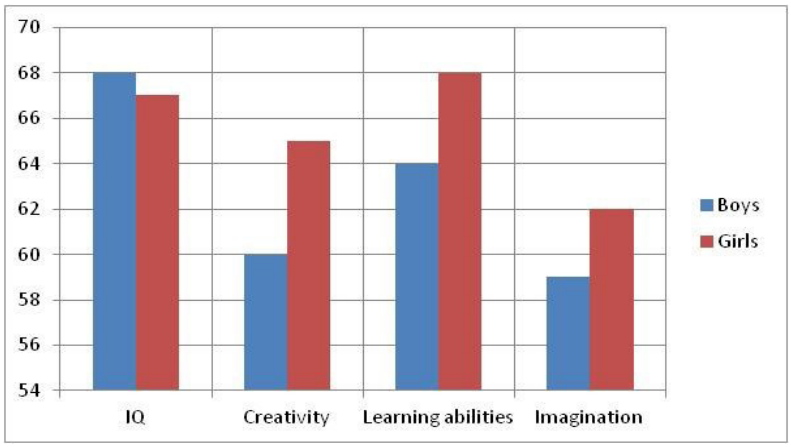

Figure 4. Teen's self-assessment of their cognitive features

Bigger differences between boys and girls appear for the features "working styles" - the girls are seeing themselves more diligent, orderly, tidy, ambitious, resourceful and tenacious (Figure 5).

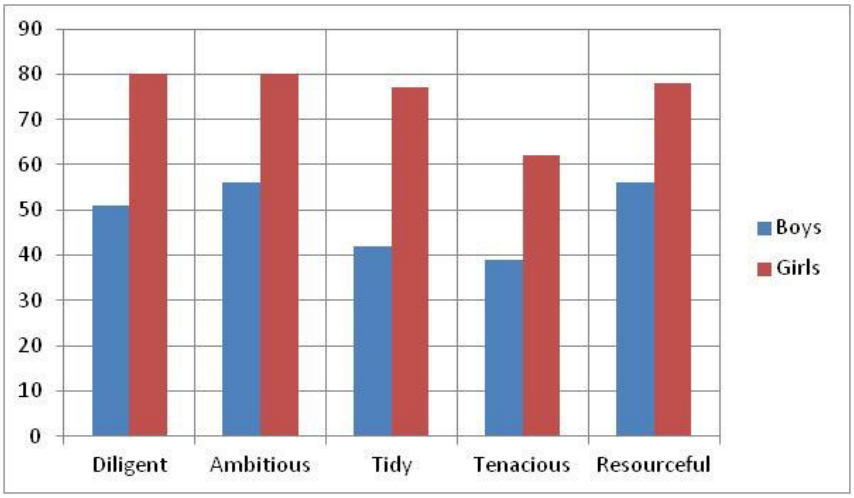

Figure 5. Teen's self-assessment of their working style

For the feature "altruistic", there were found average scores in both categories, so both boys and girls are concerned about the problems of others, empathetic, open and willing to help, which can justify the increased preference for subjects with social relevance. That is they are interested in theoretical implications on their lives and on society as a whole, for preventing, alleviating or resolving any problem.

For the feature "social relations" scores, results were quite heterogeneous, and there could not be used for correlations. Also, the "looks" feature obtained similar scores for both genders, but was considered irrelevant for the subject preferences.

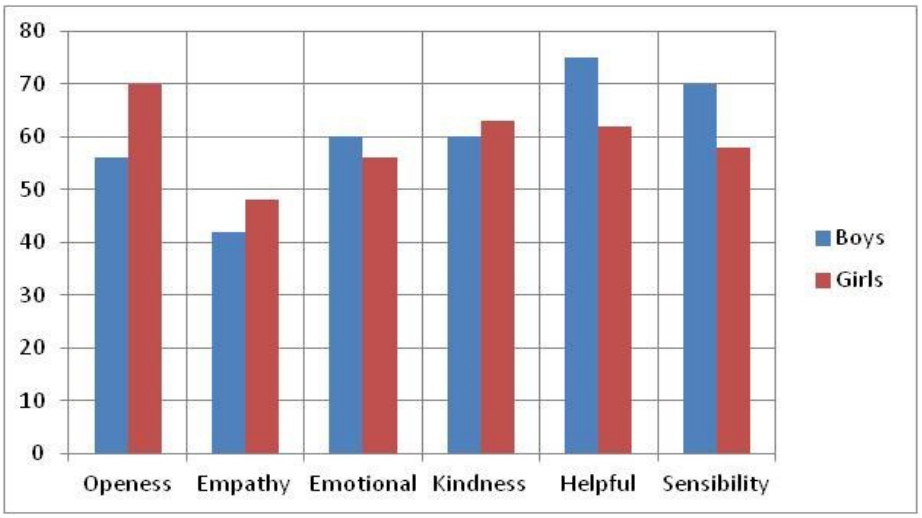

Figure 6. Teen's self-assessment of "altruistic" feature

5. Conclusions

We found positive correlation between preferences for complex, hard thinking subjects and teenagers positive image (specifically with the high scores on cognitive features) - hypothesis 1 is validated.

Also, positive correlation was registered between the item altruistic features and preferences for personal and social relevance. There was no relevant data to validate hypothesis 2.

All questioned topics were considered important and even more by most of the teens and almost all of them have positive self-image. That suggested the positive self-image can be a predictor of Science disciplines study. Also, this research emphasizes the teen agers need for self-knowledge and building a positive self-image for a better adaptation to scientific classes. Also, we found that self-image`s altruistic features can support scientific literacy, through teens interest`s activation in other`s or social`s daily problems.

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